

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

Ex Parte: Venkitaraman, et al.
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Filing Date: February 27, 2002
Title: METHOD AND APPARATUS FOR PROVIDING IP
MOBILITY FOR MOBILE NETWORKS AND
DETACHABLE MOBILE NETWORK NODES
Confirmation No. 2114
Art Unit: 2616
Examiner: Kevin C. Harper

BRIEF ON BEHALF OF APPELLANTS UNDER 37 CFR 41.37

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I. REAL PARTY IN INTEREST

The names of the real party in interest for purposes of this appeal is Motorola, Inc., a Delaware corporation, the assignee of record.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Applicant, the Applicant's legal representative, or assignee which would directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF CLAIMS

Claims 16, 19, 20, and 24-44 are pending and stand finally rejected in a Final Office action mailed on May 17, 2007 in which Claim 41 was rejected under 35 U.S.C. 102(a) as being anticipated by applicant's admitted prior art (specification, page 2, lines 25-29); and in which the Claims 16, 19-20, and 24-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al (US 6,992,995) in view of Sorensen (US 2002/0061009); and in which Claims 30-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal in view of Sorensen as applied to Claim 16, and further in view of Malki (US 2001/0046223); and in which Claims 42-43 were rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Agrawal et al (US 6,992,995); and in which Claim 44 was rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Agrawal et al (US 6,992,995), as applied to Claim 43, and in further view of Inoue et al (US 2002/0191576). Claims 1-15, 17-18, and 21-23 were canceled.

Claims 16, 19, 20, and 24-44 are under appeal. Claims 16, 19, 20, and 24-44 stand or fall together.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made subsequent to the Final Office Action mailed May 17, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Although specification citations are inserted below in accordance with 37 C.F.R. § 41.37, these reference numerals and citations are merely examples of where support may be found in the specification for the terms used in this section of the brief. There is no intention to in any way suggest that the terms of the claims are limited to the examples in the specification. Although, as demonstrated by the reference numerals and citations below, the claims are fully supported by the specification as required by law, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology, as is done here to comply with rule 41.37, does not in any way limit the scope of the claims to those examples from which they find support. Nor does this exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from the specification. In short, the reference numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

The invention, as defined in independent Claim 16 is a method of operation of a mobile node (116) within a communication system (100) supporting mobile IP, wherein the mobile node (116) is operable to connect to a network infrastructure via one or more gateway routers (112), the method comprising: determining that the mobile node (116) is attached to a mobile gateway router (112) associated with a mobile network (110); and maintaining a binding list of one or more correspondent nodes (126) that have received a binding update (600) corresponding to the mobile node (116), wherein the mobile node (116) maintains the binding list when the mobile node (116) is in a home network of the mobile node (116). (See, for example, page 9, lines 28-30, and FIG. 6, and page 13, lines 6 through 26 of Applicant's original specification.)

The invention, as defined in independent Claim 41 is a method of operation of a mobile node (116) within a communication system (100) supporting mobile IP, wherein the mobile node (116) is operable to connect to a network infrastructure via one or more gateway routers (112), the method comprising: detaching from a home network of the mobile node (116); determining one or more correspondent nodes (126) that have received a binding update corresponding to the

mobile node (116), where the determination is made prior to receiving any packets from the correspondent node (126); and sending a binding update (800) to the one or more correspondent nodes (126) to inform the one or more correspondent nodes (126) of a mobile new care-of address. (See, for example, FIG. 8, and page 14, line 16 through line 30 of Applicants' originally filed specification.)

Accordingly, the invention as defined by Independent Claims 16 includes the limitation of "the mobile node (116) maintains the binding list when the mobile node (116) is in a home network of the mobile node (116)." Similarly, the invention as defined by Independent 41 includes the limitation of "determining one or more correspondent nodes (126) that have received a binding update corresponding to the mobile node (116), where the determination is made prior to receiving any packets from the correspondent node (126)." Further, Claim 41 requires sending a binding update to the one or more correspondent nodes to inform the one or more correspondent nodes of a mobile new care-of address." These claimed features are not disclosed in the references cited in the Office Action.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A. Whether Claim 41 is unpatentable under 35 U.S.C. 102(a) over applicant's admitted prior art (specification, page 2, lines 25-29).
- B. Whether Claims 16, 19-20, and 24-29 are unpatentable under 35 U.S.C. 103(a) over Agrawal et al (US 6,992,995) in view of Sorensen (US 2002/0061009).
- C. Whether Claims 30-40 are unpatentable under 35 U.S.C. 103(a) over Agrawal in view of Sorensen as applied to Claim 16, and further in view of Malki (US 2001/0046223).
- D. Whether Claims 42-43 are unpatentable under 35 U.S.C. 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995).

E. Whether Claim 44 is unpatentable under 35 U.S.C. 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995), as applied to Claim 43, and in further view of Inoue et al (US 2002/0191576).

VII. ARGUMENT

A. **Claim 41 is allowable under 35 U.S.C. 102(a) over applicant's admitted prior art (specification, page 2, lines 25-29).**

With respect to 35 U.S.C. § 102, MPEP § 2131 provides: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F. 2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim.

Applicant respectfully submits that "applicant's admitted prior art (specification, page 2, lines 25-29)" does not anticipate each and every element of Claim 41, either expressly or inherently. Specifically, Claim 41 requires "sending a binding update to the one or more correspondent nodes to inform the one or more correspondent nodes of a mobile new care-of address." This element is not described nor anticipated in "applicant's admitted prior art (specification, page 2, lines 25-29)." Specifically, "applicant's admitted prior art (specification, page 2, lines 25-26)" states that the mobile nodes "inform their home agent of their new care of address." "Applicant's admitted prior art (specification, page 2, lines 25-29)" does not describe nor anticipate that a binding update sent to correspondent nodes includes the care-of address.

Therefore, since some elements are missing from the "applicant's admitted prior art (specification, page 2, lines 25-29)" reference, a rejection of Claim 41 under 35 USC 102(a) over "applicant's admitted prior art (specification, page 2, lines 25-29)" is improper and should be withdrawn.

B. Claims 16, 19-20, and 24-29 are allowable under 35 U.S.C. 103(a) over Agrawal et al (US 6,992,995) in view of Sorensen (US 2002/0061009).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009), taken either singly or in combination, does not teach or suggest all the claim limitations of Independent Claim 16. Specifically, Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) does not anticipate maintaining a binding list even when a mobile is connected to a home network.

In Col 3, lines 57-62, Agrawal mentions "...presence of special agents in foreign networks. Location updates are directly transmitted from the mobile nodes to correspondent nodes using binding updates messages (a mobile node maintains a list of current correspondent nodes), thereby reducing the role of the home agent....". This is in relation to the mobile node operation in a foreign network. Note that even in the quoted sentence the Agrawal talks about maintaining binding list to reduce the role of home agent. Om Agarwal et al, when a mobile node is in its home network, the home agent has NO role to play. It is only when the mobile node is in the foreign network that the home agent has a role (to proxy for the mobile node and tunnel packets). A mobile node sending binding updates and maintaining the binding list can reduce the role of home agent. Further more note that context of this sentence is also in reference to foreign

network, ref: Col3 lines 35-42 and Col3 lines 55-57. Finally when an mobile node is in its home network, the term Care of Address does not make sense, by definition, it is an address of the mobile in a foreign network. Sending a binding update message requires a Care of Address. So Agrawal does not in disclose, suggest or imply the creation of binding list when the mobile node is in the home network.

Further, Agrawal also does not provide any motivation for keeping the list when the mobile node is in the home network. As described in the previous paragraph, Agrawal provides motivation only when the mobile is in foreign network.

Applicant's claimed invention solves the problem that when the mobile node moves out of the "home network" (in this case its home mobile router) it will become unreachable unless it updates the correspondent nodes. Applicant's claimed invention solves the problem by putting a small amount of mobility management on the correspondent nodes even when it is in the home network, specifically to track correspondent nodes that have received a binding update corresponding to the mobile node even when the mobile is in the home network. Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) does not anticipate these claimed limitations.

Applicant respectfully disagrees with the Examiner's contention in item 1, page 2, of the office action dated May 17, 2007 that it "would appear unreasonable for the mobile unit to abandon its binding list only because it has roamed from a foreign network to a home network." Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) provides no motivation for this conclusion that it is obvious that a mobile node which is in its home network will need to actively maintain a binding list and send binding updates. Applicant respectfully submits that due to the significant overhead required on a node in terms of processing power, state and bandwidth to always keep track of every node that has previously sent a packet to the mobile node, send an update to that node and periodically refresh them, it would not be obvious to maintain such a list.

Therefore, since some elements are missing from the Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) references, a rejection of Claim 16

under 35 USC 103(a) over Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) is improper and should be withdrawn.

Applicant respectfully submits further that since Claims 19, 20, and 24-29 contain further limitations of the allowable Claim 16, a rejection of Claims 19, 20, and 24-29 under 35 USC 103(a) over Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) is also improper and should be withdrawn.

C. Claims 30-40 are allowable under 35 U.S.C. 103(a) over Agrawal in view of Sorensen as applied to Claim 16, and further in view of Malki (US 2001/0046223).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) and further in view of Malki (US2001/0046223) does not anticipate Applicant's invention as claimed in claims 30-40. Claims 30-40 contain further limitations of independent Claim 16 which was shown to be allowable previously herein.

Specifically, Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) and further in view of Malki (US2001/0046223) does not anticipate

having a care of address in a home network. In Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) and further in view of Malki (US2001/0046223), a mobile node sends a binding update with its CoA to a correspondent node and adds the CN to the binding list. By definition a CoA is a topologically correct address obtained by the mobile node in a foreign network. [See Column 3, lines 2-10 in Agarwal et al., for example] Furthermore, what would a mobile-node use as CoA when it is in its home network? That is also not obvious either. Note that the mobile node already has its home address which is topologically correct address in its home subnet.

Applicant respectfully points out to the Examiner that Malki, paragraph 32 is in the context of figure 3 which clearly shows the mobile away from its home network. Furthermore in paragraph 5, when describing the context, it states that a mobile obtains a CoA when it is in a foreign network. Both the LCoA and RCoA are in the context of a foreign network. Malki does not teach the concept of a mobile node maintaining a binding update list when it is in its home network. Applicant respectfully submits that it is non-intuitive for a mobile node to keep a binding list of the nodes when it is in its home network.

Applicant therefore respectfully submits further that since Claims 30-40 contain further limitations of the allowable Claim 16, a rejection of Claims 30-40 under 35 USC 103(a) over Agarwal et al (US 6,992,995) in view of Sorenson (US2002/0061009) and further in view of Malki (US 2001/0046223) is improper and should be withdrawn.

D. Claims 42-43 are allowable under 35 U.S.C. 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined)

must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that applicant's admitted prior art in view of Agrawal et al (US 6,992,995) does not teach or suggest all the claim limitations of Claims 42-43. Specifically, Claims 42 and 43 require "using a binding list which is maintained by the mobile node when the mobile node is in the home network." As described previously herein with respect to Independent Claim 16, Agrawal et al does not anticipate, either expressly or impliedly, this element.

In Col 3, lines 57-62, Agrawal mentions "...presence of special agents in foreign networks. Location updates are directly transmitted from the mobile nodes to correspondent nodes using binding updates messages (a mobile node maintains a list of current correspondent nodes), thereby reducing the role of the home agent....". This is in relation to the mobile node operation in a foreign network. Note that even in the quoted sentence the Agrawal talks about maintaining binding list to reduce the role of home agent. Om Agarwal et al, when a mobile node is in its home network, the home agent has NO role to play. It is only when the mobile node is in the foreign network that the home agent has a role (to proxy for the mobile node and tunnel packets). A mobile node sending binding updates and maintaining the binding list can reduce the role of home agent. Further more note that context of this sentence is also in reference to foreign network, ref: Col3 lines 35-42 and Col3 lines 55-57. Finally when an mobile node is in its home network, the term Care of Address does not make sense, by definition, it is an address of the mobile in a foreign network. Sending a binding update message requires a Care of Address. So Agrawal does not in disclose, suggest or imply the creation of binding list when the mobile node is in the home network.

Further, Agrawal also does not provide any motivation for keeping the list when the mobile node is in the home network. As described in the previous paragraph, Agrawal provides motivation only when the mobile is in foreign network.

Applicant respectfully submits further that since Claims 42-43 contain further limitations of the allowable Claim 41, and since applicant's admitted prior art in view of Agrawal et al (US 6,992,995) does not teach or suggest all the claim limitations of Claims 42-43, a rejection of Claims 42-43 under 35 USC 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995) is improper and should be withdrawn.

E. Claim 44 is allowable under 35 U.S.C. 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995), as applied to Claim 43, and in further view of Inoue et al (US 2002/0191576).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits further that since Claim 44 contains further limitations of the allowable Claim 43, a rejection of Claim 44 under 35 USC 103(a) over applicant's admitted prior art in view of Agrawal et al (US 6,992,995) as applied to Claim 43, and in further view of Inoue et al (US 2002/0191576) is improper and should be withdrawn.

For the reasons set forth above, Applicants submit that the Examiner has incorrectly rejected Claims 16, 19, 20, and 24-44 and request that the Board withdraw the rejections.

Respectfully submitted,

Enclosures

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VIII. CLAIMS APPENDIX

16. A method of operation of a mobile node within a communication system supporting mobile IP, wherein the mobile node is operable to connect to a network infrastructure via one or more gateway routers, the method comprising:

determining that the mobile node is attached to a mobile gateway router associated with a mobile network; and

maintaining a binding list of one or more correspondent nodes that have received a binding update corresponding to the mobile node,

wherein the mobile node maintains the binding list when the mobile node is in a home network of the mobile node.

19. The method of claim 16, wherein the mobile node comprises a mobile router.

20. The method of claim 16, wherein the mobile node comprises a mobile network node detached from a mobile network.

24. The method of claim 38 wherein the care of address comprises at least one of a home address of a) the mobile gateway router and b) the mobile node.

25. The method of claim 38 wherein the care of address comprises an address in a home subnet of the mobile node.

26. The method of claim 16 wherein the mobile node comprises an IP-addressable device.

27. The method of claim 16, further comprising sending a binding update to the one or more correspondent nodes.

28. The method of claim 27 wherein the binding update is generated in response to a tunneled packet from at least one of a) the one or more correspondent nodes, b) the mobile gateway router, and c) a home agent of the mobile node.

29. The method of claim 16 further comprising identifying that a packet was received from the one or more correspondent nodes without traversing a home agent.

30. The method of claim 16, further comprising:
detaching from the mobile gateway router;
attaching to a gateway router in a fixed site in the communication system; and
sending a binding update to the one or more correspondent nodes that are in the binding list of the mobile node to inform the one or more correspondent nodes of the mobile node's attachment to the fixed site.

31. The method of claim 38 wherein the binding update is sent to the one or more correspondent nodes identified in the binding update list.

32. The method of claim 31 wherein the binding update comprises a care of address in a subnet that the mobile node is currently attached to.

33. The method of claim 31 wherein the binding update comprises a care of address of a home address of the mobile gateway router to which the mobile is attached.

34. The method of claim 16, further comprising:
detaching from the mobile gateway router;
attaching to a second mobile gateway router in a second mobile network in the communication system; and
sending a binding update to the one or more correspondent nodes that are in the binding list of the mobile node to inform the one or more correspondent nodes of the mobile node's attachment to the second mobile network.

35. The method of claim 34 wherein the binding update is sent to the one or more correspondent nodes identified in the binding update list.

36. The method of claim 35 wherein the binding update comprises a care of address in a subnet that the mobile node is currently attached to.

37. The method of claim 35 wherein the binding update comprises a care of address of a home address of the mobile gateway router to which the mobile is attached.

38. The method of claim 16 further comprising when the mobile node has moved away from the home network:

obtaining a care of address comprising the home address of the mobile gateway router;
and
sending the care-of address to a home agent of the mobile node.

39. The method of claim 38, further comprising sending a binding update to the one or more correspondent nodes.

40. The method of claim 39 wherein the binding update is generated in response to a tunneled packet from at least one of a) the one or more correspondent nodes, b) the mobile gateway router, and c) a home agent of the mobile node.

41. A method of operation of a mobile node within a communication system supporting mobile IP, wherein the mobile node is operable to connect to a network infrastructure via one or more gateway routers, the method comprising:

detaching from a home network of the mobile node;

determining one or more correspondent nodes that have received a binding update corresponding to the mobile node, where the determination is made prior to receiving any packets from the correspondent node; and

sending a binding update to the one or more correspondent nodes to inform the one or more correspondent nodes of a mobile new care-of address.

42. The method of claim 41, wherein the step of determining one or more correspondent nodes comprises using a binding list which is maintained by the mobile node when the mobile node is in the home network.

43. The method of claim 42, wherein the binding list comprises one or more correspondent nodes that have received a binding update mapping an address corresponding to the mobile node to a care of address.

44. The method of claim 43, where in the care of address comprises an address corresponding to the mobile gateway router.

IX. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, entered by the examiner and relied upon by the appellant in the appeal, or relied upon by the examiner as to grounds of rejection to be reviewed on appeal.

X. RELATED PROCEEDINGS APPENDIX

No decisions have been rendered by a court of the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 C.F.R. § 41.37.